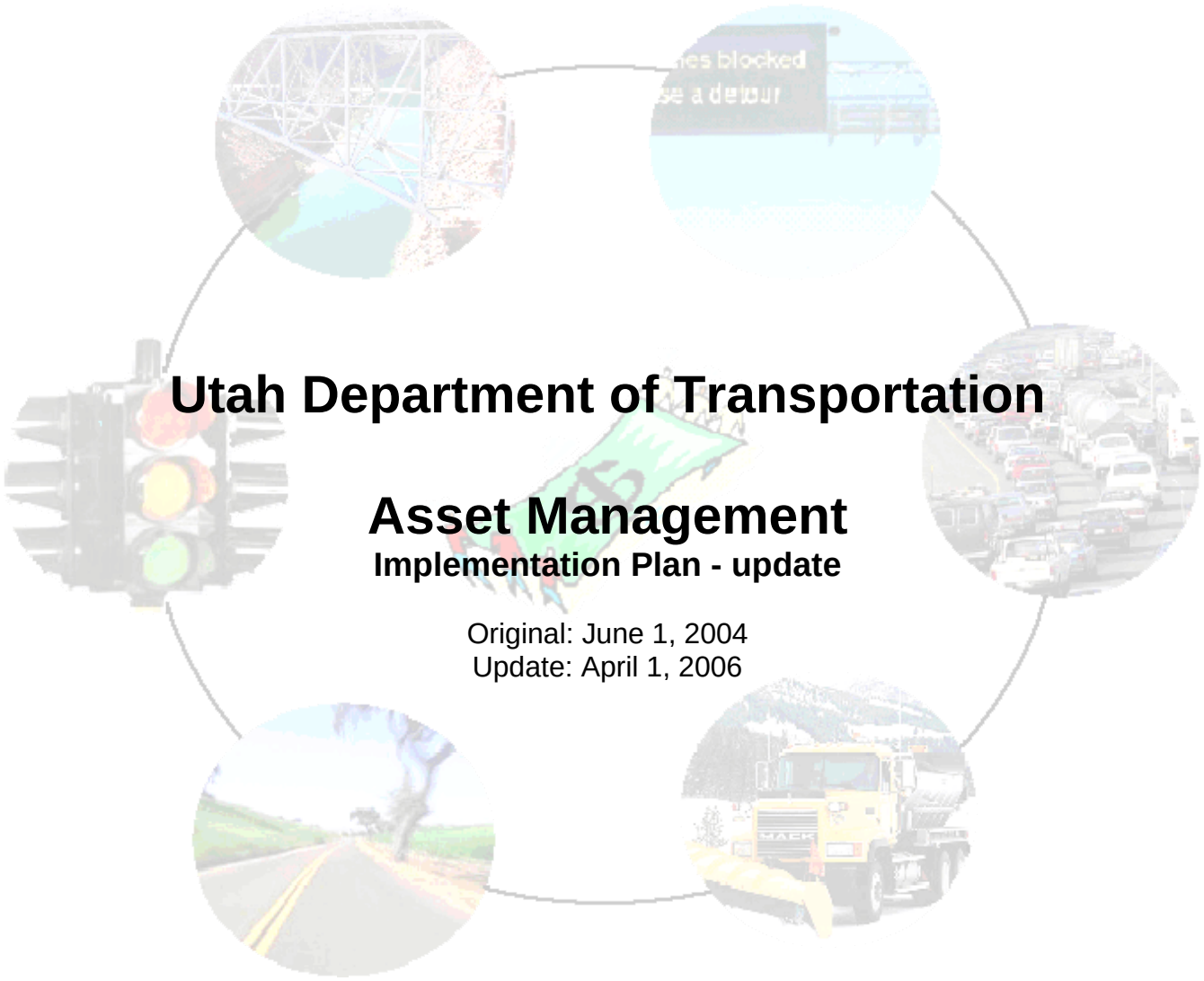

Utah Department of Transportation

Asset Management

Implementation Plan - update

Original: June 1, 2004
Update: April 1, 2006

Prepared by:

UDOT Connecting Communities
ASSET MANAGEMENT

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AM Implementation Plan Update Synopsis

This document, published April 1, 2006, is an update, or progress report, of the first version, which was published June 1, 2004. Since that time, many of the goals, objectives and strategies of the Asset Management Implementation Plan have been achieved. This document will show completed items in gray text. Some goals in the previous document were simply stated as "consolidated" and have been removed from this update. Action plans that are complete or ongoing have also been removed from this document.

Goal 6: Most of the remaining work in the Plan is found in this Goal, which pertains to data. For this goal to be completed, the Asset Groups must submit final drafts of their Data Collection Policies to the AM Team.

Goal 20: Portfolio Management Team (PMT) must vote to approve ProjectWise. Then, it will be implemented over the next 4 years, beginning with PreConstruction and Structures, then Construction, then Complex 2nd and 3rd floors, then Human Resource and Comptroller. DTS and Ed Rock are the responsible parties for implementing this system after the PMT approves its funding. For the purposes of this plan, this goal will be considered complete upon funding for the project.

Goal 23: The pavement and bridge asset groups have updated their management systems with the current location referencing, but traffic and safety and some of the regions are still on older location referencing. T&S is waiting for the new Safety Management System to come on board before they load in the latest location referencing. The regions are working on updating their systems, using Dave Blake and Chris Glazier as resources.

A. Introduction

This document follows the UDOT Self-Assessment Survey Report, which outlines the need for improvement of asset management implementation within the Utah Department of Transportation.

Section A describes the Asset Management *methodology* that the UDOT envisions today and what it will attain in the future. Section B documents the major *goals, objectives, and strategies* to be addressed within a three-year time frame by TRANSMAT, which consists of key managers to the success of asset management. Finally, Section C outlines the *action plans*, which will resolve critical issues and direct UDOT towards achieving the goals that they have set.

A.1 Mission Statement

Recognizing that Asset Management is a process or methodologies that UDOT can use to cost effectively deliver an efficient, effective, reliable and safe transportation service, the mission of UDOT Asset Management Implementation is:

- Put in place the plans, people, processes and products which enable UDOT to implement accepted asset management practices in a timely and cost-effective manner;

And

- Continually monitor and improve the asset management implementation over time;

So That

- Benefits to UDOT in the areas of Accountability, Communication, Risk Management and Financial Efficiency can be realized.

A.2 Vision

In three to five year's time UDOT's Asset Management System will be:

- Integrated: where funding allocation decisions are broad-based across various asset categories;
- Automated: so that funding allocation decisions are generated in a more systematic, repeatable and objective manner;
- Expanded: to include other network assets other than just pavements and bridges;
- Accessible: to all UDOT stakeholders through the Internet or other communication media.

A.3 Value Statement

The Asset Management Implementation Plan will subscribe directly with the purpose of the Utah Department of Transportation, which is stated as follows:

The Utah Department of Transportation exists as a government agency for the purpose of providing *mobility* and *access* to the people of Utah in a safe and economically efficient manner to support and connect Utah's communities. The Department is committed to accomplishing this purpose in a manner consistent with the principles of Context Sensitive Solutions. That is, all Department activities will:

- Address the transportation need
- Be an asset to the community and
- Fit in with the natural and built environment.

The Plan will also work in conjunction with UDOT's strategic goals, which have been labelled "The Final Four":

- Take Care of What We Have
- Make the System Work Better
- Improve Safety
- Increase Capacity

A.4 Motto

Keep it simple!

Keep it growing!

Keep it Utah's!

Asset Management Resource Allocation and Utilization

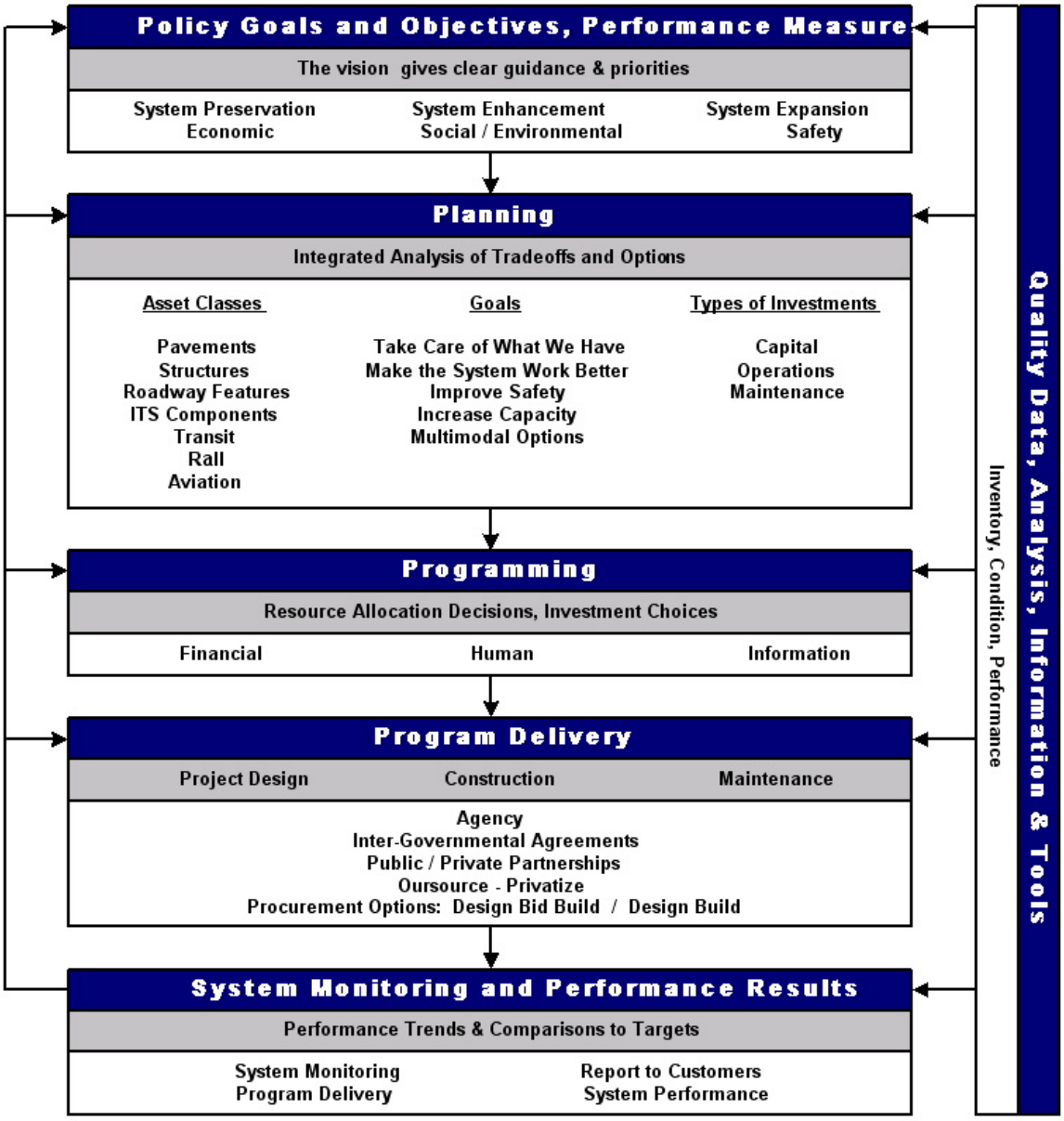

Figure A1. Transportation Asset Management Framework

A.5 Narrative

This narrative provides a framework for transportation asset management. It has been adopted from material developed in NCHRP 20-24(11). Asset management is, at its core, a process of resource allocation and utilization. Resources in this context are interpreted broadly, encompassing financial, human, information, material, and equipment inputs to the management of the physical transportation infrastructure. The process of assigning or distributing these resources and applying them to UDOT's mission is likewise interpreted broadly, encompassing not only the traditionally understood functions in planning, program development, and budget approval, but also program delivery, system monitoring, data analysis, and input to policy formulation.

Figure A1 illustrates a strategic, integrated, systematic, and interdisciplinary approach to asset management for physical transportation infrastructure. The approach is cast as a resource allocation and utilization process. Note that the blocks in Figure A1 are general stages in the process; each block may comprise a number of individual processes and specific procedures, involving several organizational units, and the sequence in which they are performed may be more complicated than that implied in Figure A1. With this qualification, a discussion of each stage in the example follows.

- **Policy Goals and Objectives.** The process is driven by stated policy goals and objectives that are aligned with the "long-term vision." "Goals" are general statements that define priority areas. "Objectives" are actual quantifiable targets that can be used when analyzing alternatives and performing tradeoffs. For example, if enhanced safety is a goal, decreasing accidents by 10 percent over the next two years may be an objective to support that goal.
- **Integrated Analysis of Options and Tradeoffs.** Several processes and procedures associated with UDOT's planning and programming functions may be conducted at this stage. Among these are the following, as examples: to identify problems and needs within the context of policy objectives, assess available resources and set realistic targets, explore alternatives to address problems and needs within financial constraints, develop information on the technical characteristics, costs, and impacts of proposed approaches, define candidate projects or service levels, analyze their benefits, costs and other impacts, rank or prioritize candidates, and evaluate tradeoffs. These analyses are performed with a wide vision of available alternatives and potential tradeoffs in investment across, for example, modes, classes of physical infrastructure assets, and types of investments (e.g., capital improvements, operations, and maintenance). Figure A1 suggests a range of asset groups, policy objectives, and types of investments as examples.
- **Decisions on Applying Resources, Investment Choices.** Based upon the analyses above, decisions can be made on recommended capital projects and levels of service for maintenance and operations activities. Program approval finalizes these allocations of resources. Financial, human, and information resources are shown as examples in Figure A1; other resources (e.g., real estate, equipment and materials) are also included as appropriate.

- **Program Delivery.** With an approved allocation of resources, asset group programs can be implemented. All available options to deliver program projects and services are considered (e.g., in-house, outsourcing, intergovernmental agreements, etc.). Figure A1 illustrates example delivery methods, but others may also be included.
- **System Monitoring and Performance Results.** Since program implementation is a continual process, monitoring of system performance must be done periodically. The resulting information is used to inform and update other stages of the overall process, as illustrated in Figure A1. For example, trends in the condition or performance of the physical infrastructure may influence future policy formulation, or the priorities given to particular programs, projects, or services in resource allocation. Observed impacts of work zones may influence future decisions on methods and timing of program delivery.
- **Quality Data & Information**. Systems of physical transportation infrastructure are extensive, and the information to describe their inventory, condition, characteristics, performance, costs, and impacts is voluminous. Developing, maintaining, and updating the management systems, decision support tools, and data that are needed to describe the asset classes and to support the functions and decisions illustrated in Figure A1 is a continuing task. Ensuring that quality information can be provided to all organizational levels in a timely, accurate, and meaningful way to assist them in fulfilling their asset management responsibilities is likewise important to the process.

In expressing resource allocation and utilization in a strategic, integrated, and systematic way, Figure A1 suggests a number of "best practices":

- **The approach is policy-driven**. Applicable policies include those embodying system performance goals, and broader policies with important transportation implications, such as those specifying economic development or social or environmental initiatives. Other elements of resource allocation – e.g., planning criteria, prioritization factors, system performance measures – are consistent with these policy goals.
- **The analysis of options and tradeoffs is strategic, interdisciplinary, and integrated**. It encompasses a number of modes and their associated infrastructure, rather than focusing on individual classes of assets. Policy goals and objectives are explicitly considered in identifying modal, programming, or technological options to meet transportation needs. Tradeoffs among modes, programs, and technologies are conducted to seek the best performance at the lowest life-cycle cost. Quality information is applied throughout these processes.
- **Programs, projects, and services are delivered in the most effective way available**. Options for delivery are continually evaluated in terms of UDOT's own labor, financial, and information resources, and those of other providers in the public or private sectors.

- **Decisions at each step are based upon quality information**. The various steps in Figure A1 – policy formulation, establishment of goals and targets, and program planning, development, and delivery – are based upon current, complete, and accurate information on system condition, performance, and forecasted trends. Management systems and supplementary decision support tools (e.g., for benefit-cost analyses or trade-off analyses) are applied to these decisions, not as "black-box" solutions, but rather as aids to managers and executives in diagnosing problems and identifying the most effective projects and services. Value is placed on the capabilities and resources to provide this quality information.
- The information base for asset management is continually renewed, with feedback for updates and improvement. Working upward from the bottom in Figure A1 to consider the several feedback loops shown:
    - **Program delivery monitoring** documents whether projects and services have been delivered on time and budget, and identifies causes of problems that may require remedy;
    - **System performance monitoring** quantifies the results of past investment decisions, establishes baselines for future decisions, and identifies updates needed in project selection criteria;
    - **System and customer surveys** update information on current asset inventory, condition, and performance, and the cost and effectiveness of project treatments and service delivery methods for use in future analyses; and

Performance trends and comparisons to targets provide information on the status of program accomplishments, needed adjustments (either in areas of program emphasis, or in the target goals and objectives), and a basis for future policy formulation.

A.6 Organizational Framework

Figure A2 shows the organizational framework for asset management within UDOT. It shows a very interactive and cyclical relationship between the Executive Team, the Asset Management Team, and Program Level Management. It is particularly important to note that all of the groups both give and receive information to/from each other. For example, the Planning Division *receives* information from the Asset Management Team through the cross asset analysis reports, yet the Planning Division *gives* information to the Asset Management Team, through input to the Executive Team, which directs the Asset Management Team, through goals and objectives. This bi-directional interaction assures strong consistency and communication throughout the entire process.

Asset Management Organizational Framework

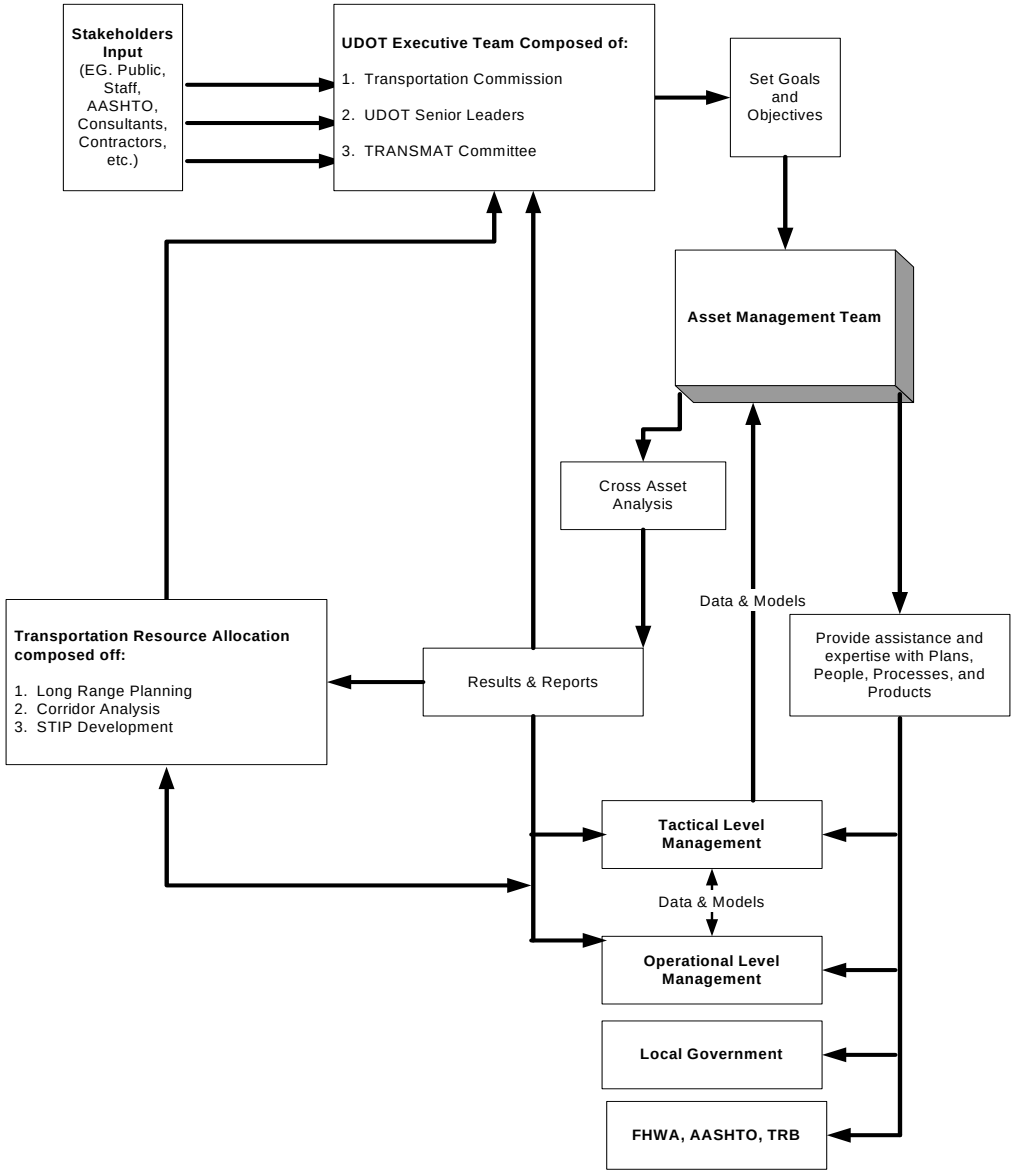

Figure A2. Organizational Framework

UDOT Asset Management Three- Year Major Initiatives (2004 – 2006)

Asset Management Team Initiatives

- Coordinate and spearhead asset management initiatives throughout UDOT;
- Develop and implement an Asset Management Implementation Plan

Policy Guidance Initiatives

- Coordinate with TRANSMAT to develop, adopt, formalize and publicize official department policy within UDOT;
- Spearhead communication of official department policy with all UDOT stakeholders.

Planning and Programming Initiatives

- Coordinate with Planning and Programming and Program Delivery to ensure best practice asset management components are utilized wherever possible;

Decision Support Systems Initiatives

- Coordinate the implementation of the Asset Management Database and the Cross Asset Analysis within dTIMS CT;
- Coordinate with Asset Groups to ensure quality data and quality models are used in planning and programming at the strategic, tactical and operational levels.

B. Goals, Objectives and Strategies

This section outlines asset management goals, objectives and strategies that have been included within UDOT Asset Management Implementation over the past three years. Items displayed with a grey font indicate goals, objectives and strategies that are complete or ongoing. Goals, objectives and strategies that are not directly related to the Asset Management System, but are only supportive of the Asset Management Framework are also shown in this manner.

Goals, objectives and strategies are listed in the following format:

0.0 Goal (applicable survey question numbers)

0.1 Objective

0.1.1 Strategy

In order to show how the goals relate back to the Survey Report, a tie to the numbered survey questions is shown in grey text following the goal statement. The key indicator of implementation progress is *the narrowing of the gap between desired and existing levels of implementation over time* for all of the survey questions. The survey may be repeated in the future to monitor asset management implementation progress.

1.0 Publish an Asset Management Implementation Plan (A7, E1, E2)

1.1 The Plan must be completed by July 6, 2004

1.1.1 Complete action plans containing goals, objectives, strategies and assigned work.

1.2 The Plan must be published using traditional and electronic means so that it is readily available to all UDOT stakeholders.

1.2.1 Publish hard copies of the Plan for TRANSMAT and load an electronic copy to AM Web Site.

1.3 The Plan must have comprehensive, well-defined goals, objectives and strategies to guide Asset Management improvements in UDOT.

1.3.1 The AM Team will crosscheck the Plan with the Self Assessment Survey Report and the NCHRP Report.

2.0 Utilize an Asset Management Database to perform cross-asset analysis and monitor the inventory, condition and performance of assets within UDOT's jurisdiction. (D2, D3, D9, D12, D16, D17, D19, D20, D21, D22, D23, E3, E4, E6, E7)

2.1 The Database includes up-to-date and accurate condition and performance data, models and strategies on pavement and bridge assets by May 12, 2004.

2.1.1 Coordinate with Asset Groups to assure that data, models and strategies are included in the Database by May 3, 2004.

2.2 Budget distributions and performance targets resulting from the cross asset analysis must be delivered to TRANSMAT on July 6, 2004.

2.2.1 Perform cross asset analysis and publish a corresponding Report for the June TRANSMAT meeting.

2.2.2 Long Range Plan utilizes the budget distributions and performance targets resulting from the cross-asset analysis.

2.2.3 Tactical and Operational Asset Group preservation plans utilize budget distributions and performance targets resulting from the cross-asset analysis.

2.3 The Database must be easily accessed and used by Asset Groups by July 6, 2004.

2.3.1 Publish the Database on the AM Web Site in two formats: Excel (data only) and ArcView (data + visualization).

6.0 UDOT will continually take appropriate action to ensure that data used for asset management analysis both at the strategic level and at the tactical or operational level are adequate for the intended purpose. (D5, D6, D7, D8, D13, E8)

6.1 A review of the data used to support each of the asset group management systems will be completed by June 1, 2006.

6.1.1 Review data used in each asset group area to identify what data items are collected, what data items are used or needed for analysis, frequency of data collection, coverage of data collection, precision/level of detail, practices used to

identify the location of data elements, practices used for quality control/quality assurance, how soon after collection data are available for analysis.

6.1.2 Assign a “data quality level” and an “analysis quality level” to each data element used for asset management.

6.2 A determination of the adequacy of data used in the strategic level (cross-asset) asset management analysis will be completed by January 6, 2005.

6.2.1 Conduct a formal study of what data will be needed for cross-asset analysis, and determine whether data currently available from the individual asset management systems are adequate for that purpose.

6.3 A formal data collection policy will be established for each of the asset group management systems by June 1, 2006.

6.3.1 Each Asset Group will define a data collection policy that specifies what to collect, frequency, sampling frequency (spacing of observations/tests), precision/detail, who will collect data (in house or contractor), and how individual elements will be uniquely identified.

6.3.2 Each Asset Group will develop and publish a Quality Control/Quality Assurance (QA/QC) Plan for the data used to support its system, by June 1, 2006.

6.4 Where identified as a need by the data review, data quality improvement plans will be developed for each asset group by June 1, 2006.

6.4.1 Each Asset Group will create a data quality improvement plan by June 1, 2006, for each data element of substandard quality, as identified by the data reviews performed.

7.0 UDOT business practices include an official policy outlining the Long Term Goals of the Transportation System. (A1, A2, A12)

7.1 The Policy identifies the Long Term Performance Goals for the Transportation System.

7.1.1 Develop a draft policy for the Long Term Goals of the Transportation System that addresses pavements, bridges, safety, and mobility.

7.2 The Policy specifies a long term, performance-based approach utilizing a life cycle cost approach.

7.2.1 The draft policy will be based on a life cycle cost approach.

7.3 The Policy specifically addresses customer satisfaction and expectations as a fundamental UDOT business practice.

7.3.1 Customer satisfaction will drive the goals that are set on a continual basis.

7.4 The Policy must be developed and implemented by June 16, 2004.

7.4.1 The mobility section is being evaluated by a Team and will be updated by the end of April. Once the draft is completed it will be presented to the Commission for comment and approval.

8.0 UDOT's business practices include customer expectations and customer satisfaction in all areas of Strategic Planning, Planning and Programming and Program Delivery. (A4, D4)

8.1 Preservation Policy and Long Range Plan specifically address customer satisfaction and expectations as a fundamental UDOT business practice.

8.1.1 Identify customers (rural and urban) and means to communicate with them.

8.1.2 Incorporate results from customer communications into Preservation Policy and Long Range Plan and establish a feedback loop to track changing expectations.

9.0 Utilize performance measures to aid resource allocation in conjunction with UDOT's strategic direction and policy favoring a performance-based life cycle cost approach. (A6, A8, D3)

9.1 Develop key performance measures for each objective within the UDOT Long Range Plan by August 31, 2004.

9.1.1 Finalize the key performance measures

9.1.2 Assign responsibility to populate the data

9.2 Develop a reporting system such as an "Annual Performance Report" to communicate current performance and future performance targets to all UDOT stakeholders.

9.2.1 Report the data through the Annual Performance Report

12.0 UDOT maintains an official policy describing the characteristics of roadways that are the responsibility of UDOT and periodically audits the transportation network to transfer assets to appropriate jurisdictions. (A13)

12.1 UDOT Transportation Network Policy addresses criteria for roadways to be included in the state highway system and the process for transferring assets to appropriate jurisdiction.

12.1.1 Follow the existing Utah Code, Title 72, and Chapter 4 as the Transportation Network Policy.

13.0 UDOT evaluates capital, operational and modal alternatives to meet system deficiencies. (B1, B2, B3, B12)

13.1 UDOT strategic planning and Long Range Plan includes sections on capital, operational and modal alternatives to meet system deficiencies.

13.1.1 TRANSMAT will review and approve budget distributions and performance targets.

13.1.2 Conduct a statewide Managed Lane Study to identify system wide opportunities for HOV, HOT, toll, reversible and other lane management techniques.

13.1.3 Understand travel demand model application in decision-making and have a clear understanding of the mode split decisions.

13.2 Conduct coordinated planning with transit agencies, bicycle/pedestrian coordinators and promote Transportation Demand Management (TDM) tools and techniques.

13.2.1 Conduct coordinated planning with transit agencies, bicycle/pedestrian coordinators and promote Transportation Demand Management (TDM) tools and techniques.

14.0 UDOT Long Range Plan incorporates strategic direction, established goals, objectives and performance measures. (B4, D17, D18)

14.1 UDOT Long Range Plan incorporates developed performance measures by July 6, 2006.

14.1.1 Utilize the recommended Performance Measures List from Goal 9.

15.0 UDOT's Planning and Programming operations will be based upon realistic projections of future revenues. (B5, B9)

15.1 Programming Section develops plausible projections of future revenues on a yearly basis prior to the Strategic Asset Management analysis prior to the Asset Group Preservation Planning Cycle.

15.1.1 As needed, work with the UDOT Comptroller Office to verify or adjust state revenue estimates as prepared by the GOPB and the Legislative Fiscal Analyst, to reflect the latest collection trends.

15.1.2 Utilizing apportionment and obligation limits contained in federal re-authorization legislation, prepare an estimate of available federal funds.

15.1.3 Extend the forecasts for state and federal funding to a period of ten years beyond the current funded program. Monitor actual available funding for variations from

estimates of +/- 10 %. Keep the Transportation Commission informed regarding trends.

15.2 Development of statewide and MPO long-range plans and STIP is demonstrated to be consistent with realistic projections of future revenues.

15.2.1 Continue coordination efforts with the MPOs and FHWA to share financial forecast information and demonstrate fiscal constraint in both the long range planning and STIP development cycles.

16.0 UDOT's Planning and Programming operations will be based upon the strategic direction, established goals, objectives and performance measures. (B7, B8, D17, D18)

16.1 By April 2006, 90% of the projects added to the STIP must be directly aligned with strategic direction, goals, objectives and performance measures.

16.1.1 Long-range plan and TIP comply with the strategic direction and goals as recommended by the TRANSMAT and approved by the Transportation Commission.

16.1.2 Increase the awareness of the strategic direction and goals by developing a communication plan for these issues. Incorporate these efforts into the larger Asset Management (TRANSMAT) communication plan.

16.1.3 Develop performance measures and management tools that assist in the monitoring and adherence to established strategic goals.

16.1.4 All Program Development employees assure that their daily work complies with the strategic direction and goals, and they are accountable for work.

17.0 UDOT's Planning and Programming operations are based upon realistic estimates of costs, benefits and impacts on system performance. (B10, B11, C10, C11, D17)

17.1 By November 2005, at least 90% of the amount funded for projects added to the STIP must be based upon realistic estimates of costs, benefits and impacts on system performance.

17.1.1 Continue to improve project concept development tools and techniques to accurately scope and estimate costs.

17.1.2 Develop and implement tools necessary to evaluate the relative benefits and impacts that projects have on system performance.

17.1.3 Define the benefits to be measured (user costs, safety improvements, life cycle costs, etc), and reach agreement on the relative weight associated with such measures.

17.1.4 As an interim measure, develop and implement project selection criteria that accounts for a variety of factors.

17.1.5 Focus planning staff efforts on increased analysis of transportation improvements in the more current portion of the long-range plan, working with the Regions to recommend projects that meet strategic objectives and system performance goals.

18.0 Maintain a listing of key performance measures to be used in Planning and Programming operations at the strategic, tactical and operational asset management areas. (D24)

18.1 The AM Web Site must contain the most recent List once it has been developed and approved by TRANSMAT.

18.1.1 As updates occur, the List will be updated and loaded to the AM Web Site

18.2 Key performance measures are relevant to customer and stakeholder satisfaction with transportation services.

18.2.1 Periodically review the List with TRANSMAT for relevancy.

19.0 UDOT investigates and reviews new technologies and approaches to program and project delivery on a continuing basis. (C1)

19.1 Project Development must perform an investigation and review of the latest technologies and approaches to program project delivery. This is an effort to programmatically apply innovative project delivery methods.

19.1.1 Assign the "Innovative Contracting Position" to coordinate and champion this goal. This position would chair an Innovative Project Delivery Methods group.

19.1.2 Perform a TRIS search of new technologies and approaches.

19.1.3 Attend TRB and specifically search new technologies and approaches for project delivery.

19.1.4 Innovative Project Delivery Methods group evaluates results of 19.1.2 and 19.1.3 above and identifies two to five strategies for further evaluation.

19.1.5 Innovative Project Delivery Methods Group coordinates with the Regions to identify and develop and evaluate pilot projects. Results of evaluations are reported to TRANSMAT and the best techniques are programmatically applied.

20.0 UDOT's project tracking system ensures project consistency from project conception phases through to the project completion phase. (C4, C5, C8, C9)

20.1 ProjectWise, which tracks project information, from planning through construction and into the maintenance, will be funded and implemented.

20.1.1 The Portfolio Management Team will approve ProjectWise for funding, then Project Development will implement it.

23.0 Establish standards for location referencing within UDOT and obtain compliance with those standards. (D10, D11, D13)

23.1 Finalize the location reference document and make it policy.

23.1.1 Review location reference standards and develop a statewide policy governing all groups, regions, and systems by May 3, 2004.

23.2 Asset groups must modify their business practices and databases to utilize the location reference standards by May 1, 2006.

23.2.1 Make adjustments in management systems and databases to comply with location reference policy by May 1, 2006. Work with each system leader to establish responsibilities and processes and strategies to ensure all systems operate within the policy.

24.0 UDOT continually reviews deterioration modeling to ensure that the current models are accurate and reflect the actual deterioration lifecycle of assets under UDOT jurisdiction. (D15)

24.1 Upon completion of the data review by April 5, 2005, 2004, UDOT prepares a model review and development schedule.

24.1.1 Identify the assets that will require an analysis of model quality.

24.1.2 For those assets identified in 24.1.1, determine the appropriate level of model quality (AQL).

24.1.3 Create a plan to achieve the desired AQL

24.2 Asset Groups must meet annually to review the accuracy and appropriateness of their analysis models.

24.2.1 Establish a review process to update the AQL per asset.

24.2.2 Establish a review process to determine the adequacy of tactical and operational level models for strategic level asset management analysis.

25.0 UDOT continually reviews the need for decision support tools throughout the department and implements those tools where appropriate. (D16, D17, D18, D19, D20)

25.1 TRANSMAT must have an awareness of the Decision Support Tools currently being used

25.1.2 The managers of each tactical and operational asset management system will make a periodic presentation to the TRANSMAT describing the decision support tool(s) used for that system.

25.1.2 The Asset Management Engineer will make a periodic presentation to the TRANSMAT describing the decision support tool used for cross-asset analysis and the decision-making framework that the tool supports.

25.2 A catalogue of Decision Support Tools will be available on the UDOT Asset Management Web Site by December 31, 2005

25.2.1 Set up a section of the UDOT Asset Management Web Site to describe each of the tactical, operational, and strategic asset management systems, models, and decision support tools and processes.

26.0 Maintain an Asset Management Web Site to disseminate information to all UDOT stakeholders. (A10, D12, E10, E11, E12)

26.1 Web Site must be operational by July 6, 2004.

26.1.1 AM Team will hold a meeting to discuss what content should be available and what should be downloadable, then assemble website and move to server by July 6th, 2004.

26.2 Web Site must be updated on a monthly basis; including updates to accomplishments in meeting policy objectives and other AM Implementation milestones.

26.2.1 AM Director will update the web site monthly with an AM Implementation Progress Report and other changes to content.

C. Action Plans

This section contains the not yet completed action plans for asset management implementation. The work described in the action plans will help UDOT reach the goals described in Section B.

There were originally are a total of 64 action plans and 178 action steps. With this update, there are now only 3 outstanding action plans and 8 action steps. In order to help show the overall picture of the task list, Figure C1 is provided. It gives the milestones, or key elements from that list of actions.

#	Date	Milestone	Goal
	2004		
1	5/4/2004	Finalize Location Reference Policy	23
2	7/6/2004	Publish final AM Implementation Plan	1
3	7/6/2004	Improved ten-year revenue projections complete	15
4	7/6/2004	Demo cross-asset analysis between bridge & pavement	2
5	7/6/2004	Asset Management Web Site operational	26
6	8/3/2004	Establish Long Term Policy Goals for Transportation System	7,8
7	8/3/2004	Planning & Programming operations are based upon the draft strategic direction, established goals, objectives and performance measures	16
8	9/7/2004	TRANSMAT recommends preservation funds distribution based on cross asset analysis (pavement and bridge only)	2
9	9/7/2004	ProjectWise funded and implementation started	20
10	12/7/2004	Key Performance Measures developed, approved, and publicized	9
	2005		
11	1/4/2005	Location Referencing System conversion complete	23
12	4/5/2005	Adequate data and models are available for cross-asset analysis	6, 24
13	5/3/2005	TRANSMAT communicates results of cross-asset analysis to Planning Section and Tactical and Operational asset groups	2
14	7/6/2005	Draft Long Range Plan published, which uses cross-asset information and is based on strategic direction and goals	13, 14
15	7/6/2005	Tactical and operational groups use cross-asset information for preservation plans and are based on strategic direction and goals.	2
16	11/1/2005	Use the most effective project delivery methods available	19
17	12/7/2005	DSS tools implemented and catalogued	25
18	12/7/2005	Planning & Programming operations are based upon the final strategic direction, established goals, objectives and performance measures	16
19	12/7/2005	Planning & Programming operations are based on realistic estimates of costs, benefits, & impacts on system performance	17
	2006		
20	7/4/2006	Location Reference Engine operational	
21	8/1/2006	Publish the final Long Range Plan (LRP). UDOT's LRP incorporates strategic direction, established goals, objectives, and performance measures	14

Figure C1. Implementation Milestones

Goal 6 UDOT will continually take appropriate action to ensure that data used for asset management analysis both at the strategic level and at the tactical or operational level are adequate for the intended purpose.

Objective 6.3 A formal data collection policy will be established for each of the asset group management systems by June 1, 2006.

Strategy 6.3.1 Each Asset Group will define a data collection policy that specifies 1) what to collect, 2) frequency (timing), 3) sampling frequency (spacing of observations/ tests), 4) precision/detail, 5) who will collect data (in house or contractor), and 6) how individual elements will be uniquely identified.

Action Plan

Action Step	Description	Responsible Person	Required Completion Date	Required Resources
6.3.1.1	Assign UDOT personnel to develop data collection policies for pavements, structures, safety, and mobility, including: 1) what to collect, 2) frequency (timing), 3) sampling frequency (spacing of observations/tests), 4) precision/detail, 5) who will collect data (in house or contractor), 6) how individual elements will be uniquely identified, and 7) standard quantitative performance measurements.	Glen Ames	May 14, 2006	
6.3.1.2	Prepare draft data collection policy statements for pavements, structures, safety, and mobility, and present to TRANSMAT.	Glen Ames	June 6, 2006	UDOT Staff time
6.3.1.3	Provide feedback on draft policy statements.	TRANSMAT	June 6, 2006	
6.3.1.4	Make revisions based on feedback and obtain approval of final data collection policy statements from appropriate UDOT entity (Division, TRANSMAT, etc.).	Glen Ames	June 8, 2006	UDOT Staff time
6.3.1.5	Publish approved data collection policies, and provide to data collection personnel	Glen Ames	June 18, 2006	

Goal 20 UDOT's project tracking system ensures project consistency from project conception phases through to the project completion phase.

Objective 20.1 ProjectWise, which tracks project information, from planning through construction and into the maintenance, will be funded and implemented.

Strategy 20.1.1 The Portfolio Management Team (PMT) will approve ProjectWise for funding, then Project Development will implement it across the department.

Action Plan

Action Step	Description	Responsible Person	Required Completion Date	Required Resources
20.1.1.1	PMT approves ProjectWise for funding	PMT	May 1, 2006	
20.1.1.2	DTS and Ed Rock implement ProjectWise over a 4-yr period.	Jim McMinimee, Ed Rock, and DTS	Ongoing	

Goal 23 Establish standards for location referencing within UDOT and obtain compliance with those standards

Objective 23.2 Asset groups must modify their business practices and databases to utilize the location reference standards by May 1, 2006.

Strategy 23.2.1 Make adjustments in management systems and databases to comply with location reference policy by May 1, 2006. Work with each system leader to establish responsibilities, processes and strategies to ensure all systems operate within the policy.

Action Plan

Action Step	Description	Responsible Person	Required Completion Date	Required Resources
23.2.1.1	Adjust management systems to comply with policy	System Manager	Dec 31, 2004	ISS Technical Advisor ISS Support
23.2.1.2	Traffic and Safety and regions will comply with the current location referencing in CARS and PFES	Robert Clayton and Region PME's	May 1, 2006	

D. Appendix

This section is supplied as an easy reference from Section B, which correlates goals to the questions.

Policy Guidance

A1. Policy guidance supports preservation of existing transportation infrastructure assets

A2. Policy guidance encourages resource allocation based upon cost-effectiveness or benefit-cost analysis

A3. Policies support a long-term life-cycle approach to evaluating investment benefits and costs.

A4. Policy guidance considers customer perceptions and expectations

A5. Our customers contribute to the process that formulates policy goals and objectives

A6. Policy guidance on resource allocation allows our agency sufficient flexibility to pursue a performance-based approach

A7. Our agency has a business plan or a strategic plan with comprehensive well-defined goals and objectives to guide resource allocation

A8. Our agency's goals and objectives are linked to specific performance measures and evaluation criteria for resource allocation

A9. Our agency estimates the resources needed to accomplish particular objectives as part of policy development

A10. Our agency regularly communicates to customers and other stakeholders our accomplishments in meeting policy objectives

A11. Our agency works with political leaders and other stakeholders to present funding options and consequences as part of our budget proposals

A12. Policies are communicated in writing and are available for all employees and stakeholders to review at any time

A13. Policy clearly defines the characteristics of roadways that should be included in the state transportation network jurisdiction and those roadways that should be owned and maintained by other agencies

Planning and Programming

B1. Our agency's long range plan includes and evaluation of capital, operational and modal alternatives to meet system deficiencies

B2. Capital versus maintenance expenditure tradeoffs are explicitly considered in the preservation of assets like pavement and bridges

B3. Capital versus operations tradeoffs are explicitly considered in seeking to improve traffic movement

B4. Our agency's long-range plan is consistent with currently established policy goals and objectives

B5. Our agency's long-range plan includes strategies that are consistent with plausible projections of future revenues

B6. Our agency's long-range plan provides clear and specific guidance for the capital program development process

B7. Our agency periodically updates its planning and programming methods to keep abreast of current policy guidance and critical performance criteria

B8. Criteria used to set program priorities, select projects and allocate resources are consistent with stated policy objectives and defined performance measures

B9. Our agency's programs are consistent with realistic projections of future revenues

B10. Our agency's programs are based on realistic estimates of costs, benefits, and impacts on system performance

B11. Project selection is based primarily on an objective assessment of relative merits and the ability to meet performance targets

B12. The preservation program budget is based upon analysis of at least life-cycle costing rather than exclusive reliance on worst first strategies

B13. A maintenance quality assurance study has been implemented to define levels of service for highway and transportation system maintenance

B14. Planning and programming periodically audits the UDOT transportation network to ensure that the network includes only those assets as defined in official policy regarding UDOT jurisdiction

B15. Planning and programming periodically transfers transportation network assets that do not meet the official policy for UDOT jurisdiction

Project Delivery

C1. Our agency periodically evaluates the use of alternative delivery options such as maintenance outsourcing, inter-governmental agreements, design-build-maintain and similar options

C2. Our agency has an incentive program for recognizing or rewarding outstanding performance in improving upon schedule, quality, and cost objectives

C3. Our agency solicits input from all affected parties to ensure that project scope is consistent with objectives of the project

C4. Our agency uses well-defined program delivery measures to track adherence to project scope, schedule, and budget

C5. Our agency has a well-established and functioning process to approve project changes and program adjustments

C6. When adding projects or changing project schedules, our agency considers effects on the delivery of other projects in the program

C7. Projects with significant changes to scope, schedule or cost are re-prioritized to ensure that they are still competitive in cost and performance

C8. Agency executives and program managers are regularly kept informed of program delivery status

C9. External stakeholders and policy-makers feel that they are sufficiently updtated on the full unit costs of construction activities

C10. Our agency maintains and uses information on the full unit costs of construction activities

C11. Our agency maintains and uses information on the full unit costs of maintenance activities

Information and Analysis

D1. Our agency has a complete and up-to-date inventory of our major assets

D2. Our agency regularly collects data on the condition of our assets

D3. Our agency regularly collects data on the performance of our assets such as (serviceability, ride quality, capacity, operations, and safety improvements)

D4. Our agency regularly collects customer perceptions of asset condition and performance

D5. Our agency continually seeks to improve the efficiency of data collection (e.g. through sampling techniques, automated equipment, and other methods appropriate to our transportation service)

D6. Our agency continually seeks to improve the quality and accuracy of data collected to make strategic, tactical and operational level decisions

D7. Our agency periodically reviews the data collection policy for each asset to determine the cost-effectiveness of the data being collected

D8. Our agency periodically reviews the data collection policy for each asset in various departments to reduce duplication and increase uniformity in data

D9. Agency managers and staff at different levels can quickly and conveniently obtain information they need about asset characteristics, location, usage, condition, and performance

D10. Our agency has established standards for location referencing that allow us to bring together information for different asset classes

D11. Our agency strictly enforces compliance to location reference standards across decision support tools and departments

D12. Our agency can easily produce reports and maps showing needs and deficiencies for different asset classes and programmed projects

D13. Our agency has established data standards to promote the consistent treatment of existing asset-related data and to guide development of future applications

D14. Information on actual work completed and costs is used to improve cost projection capabilities of our management systems at the strategic, tactical and operational levels

D15. Information on changes in asset condition over time is used to improve forecasts of asset life and deterioration in our management systems at the strategic, tactical, and operational levels

D16. Our agency uses asset management decision support tools to calculate and report actual system performance

D17. Our agency uses asset management decision support tools to identify system deficiencies or needs

D18. Our agency uses asset management decision support tools to rank candidate projects for the capital program

D19. Our agency uses asset management decision support tools to forecast future system performance given a proposed program of projects

D20. Our agency uses asset management decision support tools to forecast future system performance under different mixes of investment levels by program category

D21. Our agency monitors actual system performance and compares these values to targets projected for its capital preservation program

D22. Our agency monitors actual system performance and compares these values to targets projected for its capital improvement program

D23. Our agency monitors actual system performance and compares these values to projected values for its maintenance and operational program

D24. Our agency periodically distributes reports of performance measures relevant to customer and stakeholder satisfaction with transportation system and services

Asset Management Implementation

E1. To ensure success and guarantee the benefits of asset management, UDOT senior leaders will support and fund initiatives by TRANSMAT and the AM Team for a minimum of three years

E2. The AM Team will formulate an improvement strategy action plan to improve AM within UDOT. TRANSMAT will finalize, improve, fund and support improvement projects to accomplish this strategy

E3. The AM Team will be responsible for maintaining an asset repository to serve as the official asset register for UDOT

E4. The AM Team will be responsible for performing the cross-asset analysis and optimization to determine funding allocations at the strategic level

E5. The funding allocations that result from the cross-asset optimization will be used in the formulation of the long-range plan

E6. The funding allocations that result from the cross-asset optimization will be used in the formulation of the asset preservation plans at the tactical and operational levels

E7. AM Team will coordinate between the management systems to ensure tactical and operational programs are delivered in conjunction with strategic objectives

E8. AM Team will assist tactical and operational level areas in improving the data and analysis models used at the respective levels and then at the strategic level

E9. AM Team will coordinate the development and implementation of Key Performance Indexes (KPIs) to be used at all levels of analysis

E10. AM Team will coordinate the development and implementation of new analysis techniques and methodologies that can be used at all levels of analysis

E11. AM Team will coordinate the development and implementation of new analysis techniques and methodologies that can be used at all levels of analysis

E12. AM Team will liaison with FHWA and other transportation agencies to share information and knowledge to further the development of AM in UDOT and the U.S.

E13. AM Team will liaison with local governments to share information and knowledge to further the development of AM in Utah